REMARKS

Reconsideration of this application, as presently amended, is respectfully requested. Claims 1-22 are pending in this application. Claims 1-22 stand rejected.

Claim Objections

Claim 3 was objected to for informalities. More specifically, the Examiner objects to claim 3 because "Claim 3 is claiming the scene detector classifies the scene into a dynamic scene, however, from the specification, it should read upon the static scene." Claim 3 has been amended in accordance with the Examiner's suggestion to change "dynamic scene" to --static scene--. This change is consistent with, e.g., steps S103 and S104 of Fig. 2

Claims 18-20 were objected to under 35 U.S.C. §1.75(c) as being in improper form for a multiple dependent claim. More specifically, claims 18-20 were objected to because a multiple dependent claim should refer to other claims in the alternative only, and cannot depend from any other multiple dependent claim. See MPEP §608.1(n). Each of claims 18-20 has been amended to change "claims 1 and 4" to --claim 1 or 4--. It is believed that claims 18-20 are now in proper form for multiple dependent claims.

In view of the above-noted amendments, withdrawal of the objections to the claims is respectfully requested.

Claim Rejections – 35 U.S.C. §102

Claims 1-6 and 9-20 were rejected under 35 U.S.C. §102(e) as being anticipated by **Chakraborty** (USP 7,110,454). For the reasons set forth in detail below, this rejection is respectfully traversed.

Chakraborty et al. discloses a system and method for segmenting a video into shots by identifying scene changes, both abrupt and gradual. More particularly, according to **Chakraborty et al.**, scene changes in a sequence of video frames are detected utilizing a combination of a plurality of "difference metrics" computed for successive video frames, the difference metrics including an interframe difference metric, a histogram difference metric and an interframe variance metric. A series of candidate scene changes are identified for each of these metrics by comparing each of the computed metrics for the successive frames to threshold levels associated with the respective difference metric. See, e.g., Abstract and col. 5, lines 1-23.

The **Chakraborty** reference teaches that the video frames are extracted from the video data (col. 8, lines 18-20) and the three different metrics are computed to determine scene changes

The Examiner asserts that **Chakraborty** discloses all of the features recited in independent claims 1, 4, 9, 13 and 14. For example, with respect to independent claim 1, the Examiner asserts that the *histogram difference metric* corresponds to the "detector for detecting shot density DS of the video"; the *interframe difference metric* corresponds to the "detector for detecting motion intensity of the respective shots"; and the identifying of abrupt and gradual scene changes (see, e.g., col. 5, lines 2-5; 35-54) corresponds to the "dynamic/static scene

detector for classifying ...into a dynamic scene with much motions or a static scene with little motions... ."

Patentability Arguments

Claims 1, 4 and 13

Although the title of the Chakraborty reference is "Integrated Method for *Scene Change* Detection," **Chakraborty** actually relates to a technology in which video is classified into units of shots and, more accurately, relates to a technology dealing with "shot boundary". In contrast, the present invention relates to a technology in which each shot is classified into scenes (a group of shots having common characteristics and meaning), which is a unit larger than the shot.

With respect to claims 1, 4, and 13, the "interframe difference metric," "histogram difference metric" and "interframe variance metric" disclosed by **Chakraborty** are all indices which are used to evaluate a degree of change in pixel value *between frames adjacent to each other*. For example, the ***interframe difference metric*** is computed as described in col. 8, lines 25-48 according to the following equation:

$$dt = \sqrt{\left(\frac{1}{MN}\sum_{ij}\left(f_{xy}(t) - f_{xy}(t-1)\right)^2\right)},$$

where f_{xy} is the pixel value of the *frame* at location (x, y). Further, for example, the ***histogram difference metric*** is computed as described in col. 8, line 49 - col. 9, line 13, by first dividing the intensity range of a *given frame* into a number of predefined bins, and then counting pixels in each bin to generate a corresponding distribution histogram. For these reasons, it is impossible to obtain "shot density" or "motion intensity" of the present invention by using these indices.

More specifically, "shot density" of the presently claimed invention cannot be obtained unless "shot boundaries detection" of **Chakraborty** is performed, and it requires as preprocessing the type of shot classification technology of **Chakraborty** to obtain "shot density" of the presently claimed invention.

Furthermore, "motion intensity" of the presently claimed invention can be obtained by using a motion vector which is obtained by analyzing the motion in the video. Therefore, it is impossible for the **Chakraborty** system to extract "motion intensity" because it does not use such information as the motion vector.

Thus, it is respectfully submitted that **Chakraborty** does not disclose or suggest the detector for detecting *shot density* and the detector for detecting *motion intensity* and the dynamic/static scene detector for classifying respective shots based on *shot density* and *motion intensity*, as recited in claim 1. Further, it is submitted that **Chakraborty** does not disclose the "slow scene detector for classifying the target shot into a slow scene of the similar shot based on *motion intensity* of the. target shot and the similar shot," as recited in claim 4. Finally, **Chakraborty** does not disclose or suggest the "a detector for detecting a *shot density DS* of the video" and "a commercial scene detector for detecting a commercial scene by comparing *a shot density* detected during a predetermined interval with a predetermined reference shot density," as currently recited in claim 13.

Claim 9

With respect to independent claim 9, the Examiner asserts that the histogram difference metric of **Chakraborty** corresponds to the "detector for detecting a histogram relating to motion directions of the shots". See Office Action, page 5, line 17 – page 6, line 3.

As noted above, the histogram difference metric is computed by dividing the *intensity range* of a given frame into a number of predefined bins with each bin corresponding to an intensity range, and then counting the number of pixels in each bin to generate the distribution histogram (see col. 8, lines 51-55). **Chakraborty** also teaches that for a compressed image, "the histogram can be approximated from the DCT coefficients using nay suitable conventional method..." (see col. 8, lines 56-62).

However, it is respectfully submitted that the histogram in **Chakraborty** merely indicates the intensity of pixel, i.e., a histogram merely arranged according to a distribution of pixel values. Thus, the invention recited in claim 9 differs from **Chakraborty** in that the histogram recited in claim 9 relates to a *motion direction of shots* while the histogram of **Chakraborty** relates to *intensity distribution* of an image. Because a histogram relating to the motion direction is provided in claim 9, the invention recite din claim 9 and the Chakraborty reference are entirely different from each other.

Claim 14

With respect to claim 14, as best understood, the Examiner appears to assert that the detection of scene changes (candidate scene changes) based on the interframe and histogram

difference metrics corresponds to the claimed "detector for detecting shot boundaries" and "commercial scene detector for detecting a commercial based on the number of shot boundaries...." See Office Action, page 7, line 17 – page 8, line 3.

The invention as recited in claim 14 includes "a detector for detecting a number of shot boundaries of the video." However, the "detector for detecting a number of shot boundaries..." relates to preprocessing for analyzing shot information, and it is possible to apply the technology of **Chakraborty** to this portion. The present invention discloses a means by which, after the shot boundaries are detected, the boundaries are combined into scenes. Thus, this technology is not equivalent to that of **Chakraborty**.

In particular, the **Chakraborty** reference discloses detecting shot boundaries (i.e., scene changes), but is *silent* regarding detecting a *commercial* scene based on the number of shot boundaries detected. More specifically, Chakraborty does not disclose that a commercial scene is detected by comparing the number of shot boundaries detected during a predetermined interval with a predetermined reference number, as presently recited in claim 14.

Claim 21

The Examiner combines **Chakraborty** with **Gonsalves** to reject independent claim 21 under §103. More specifically, the Examiner asserts that **Chakraborty** discloses all of the features of claim 21, except the "inserting means for inserting a video transition effect into a combined portion of the respective highlight scenes." The Examiner relies on **Gonsalves** to teach the feature missing from **Chakraborty**. See Office action, pages 11 and 12, Item 7.

As discussed above, **Chakraborty** relates to a technology in which video is classified into units of shots, whereas claim 21 of the present invention relates to a detection of highlight scenes (a group of shots, such as a scoring scene in sports, which has an important significance) included in the video and to a inserting method of a video transition effect when a plurality of highlight scenes are combined together. Therefore, the invention as recited in claim 21 is not disclosed in **Chakraborty.**

Furthermore, **Gonsalves** merely discloses a method for effectively displaying (Graphical User Interface) the layout of graphic overlay, a rotoscoping operation, and the like when these are performed in different fields. This is entirely different from a technology which is a type of video transition effect to be inserted, such as dissolve or wipe is changed according to the characteristics of the scene in the case where a plurality of highlight scenes are temporally combined together, which is disclosed in the present invention.

Accordingly, it is respectfully submitted that neither **Chakraborty** nor **Gonsalves** appear to disclose or suggest the claimed "extracting and combining means for extracting and combining a plurality of highlight scenes." Further, the Examiner has not pointed out where this feature is disclosed in the references. Note, the Examiner states that claim 21 is substantially the same as claim 1 and relies on this statement to support the rejection of claim 21. However, claim 1 does not include the "extracting and combining" feature of claim 21. Therefore, it is respectfully submitted that the Examiner has not pointed out where this feature is disclosed in either of claim 1 or claim 21.

Furthermore, the Examiner relies on **Gonsalves** to teach the claimed "inserting means". However, although **Gonsalves** may disclose inserting a transition effect between frames, **Gonsalves** does not disclose or suggest the feature "wherein the inserting means makes a type of the video transition effect to be inserted different *according to whether the highlight scenes to be combined are the dynamic scene or the static scene*."

For all of the reasons set forth above, it is submitted that each of independent claims 1, 4, 9 13, 14 and 21, and claims dependent therefrom, patentably distinguish over the cited prior art and therefore define allowable subject matter. Reconsideration and withdrawal of the rejection under §102 and §103 are respectfully requested.

Claim Rejections-35 U.S.C. §103

Claims 7-8 were rejected under 35 U.S.C. §103(a) as being unpatentable over **Chakraborty** (USP 7,110,454) as applied to claim 6 above, and further in view of **Blanchard** (USP 6,347,114). Claims 21, 22 are rejected under 35 U.S.C. §103(a) as being unpatentable over **Chakraborty** (USP 7,110,454) in view of **Gonsalves** (USP 6,392,710).

The rejection of claims 21 and 22 was discussed above. With respect to dependent claims 7 and 8, it is submitted that these claims are allowable by virtue of their dependency on independent claim 4.

CONCLUSION

In view of the foregoing amendments and accompanying remarks, it is submitted that all pending claims are in condition for allowance. A prompt and favorable reconsideration of the rejection and an indication of allowability of all pending claims are earnestly solicited.

If the Examiner believes that there are issues remaining to be resolved in this application, the Examiner is invited to contact the undersigned attorney at the telephone number indicated below to arrange for an interview to expedite and complete prosecution of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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